

Subj 38 (New). An improved propellant composition comprising a fuel, reduced energy binder, and an oxidizer, wherein said reduced energy binder includes a cured high molecular weight polyester polyol binder polymer including poly(tetramethylene adipate) having a molecular weight (MW_n) above 4000 and an amount of energetic plasticizer wherein the plasticizer to polymer ratio is less than about 1.6:1.

Subj
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Cont 39 (New). A propellant composition as in claim 38 wherein the energetic plasticizer is a nitrate ester plasticizer selected from the group consisting of nitroglycerin, n-butyl-2-nitrotoethyl nitramine and trimethylolethane trinitrate and combinations thereof.

Subj 40 (New). A propellant composition as in claim 39 wherein the binder polymer has a molecular weight (MW_n) of about 6,000.

Subj 41 (New). A propellant composition as in claim 40 further comprising an amount of triacetin plasticizer.

Subj 42 (New). A propellant as in claim 40 wherein the plasticizer to polymer ratio is about 1:1.

Subj 43 (New). A reduced energy binder for energetic compositions comprising an amount of cured poly(tetramethylene adipate) polyester polyol polymer having an uncured prepolymer a molecular weight (MW_n) of at least 4,000 in combination with an amount of one or more energetic plasticizers, wherein the ratio of plasticizer to polymer is less than 1.6:1.

Subj 44 (New). A reduced energy binder as in claim 43 wherein the polyester polymer is cured using an amount of a polyisocyanate.

Subj 2

45 (New). A reduced energy binder as in claim 43 further comprising an amount of inert plasticizer.

46 (New). A reduced energy binder as in claim 45 wherein the inert plasticizer is triacetin.

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47 (New). A reduced energy binder as in claim 45 wherein the one or more energetic plasticizers are selected from the group consisting of nitrate esters of the group consisting of n-butyl-2-nitrotoethyl nitramine; trimethylolethane trinitrate; triethyleneglycol dinitrate; butanetriol trinitrate; nitroglycerin and combinations thereof.

48 (New). A reduced energy binder as in claim 47 wherein the one or more energetic plasticizers are selected from the group consisting of nitroglycerin, n-butyl-2-nitrotoethyl nitramine, trimethylolethane trinitrate and combinations thereof.

Subj E 3

49 (New). A reduced energy binder as in claim 43 wherein the energetic plasticizers are selected from nitrate esters of the group consisting of n-butyl-2-nitrotoethyl nitramine; trimethylolethane trinitrate; triethyleneglycol dinitrate; butanetriol trinitrate; nitroglycerin and combinations thereof.

50 (New). A reduced energy binder as in claim 49 wherein the plasticizer is selected from the group consisting of nitroglycerin, n-butyl-2-nitrotoethyl nitramine and trimethylolethane trinitrate and combinations thereof.

Subj E 4

51 (New). An improved high solid propellant composition comprising by weight:

- c*
- (a) about 10% cured poly(tetramethylene adipate) ($M_{W_n} \geq 6000$) binder polymer;
- (b) about 11% nitroglycerin plasticizer;
- (c) about 2.5% triacetin plasticizer;
- (d) about 22% aluminum; and
- (e) about 53% ammonium perchlorate oxidizer.

52 (New). An improved high solids propellant composition
comprising by weight:

- D*
- c*
- (a) about 7% cured poly(tetramethylene adipate) ($M_{W_n} \geq 6000$) binder polymer;
- (b) about 6.5% n-butyl-2-nitratoethyl nitramine;
- (c) about 1.4% triacetin;
- (d) about 22% aluminum;
- (e) about 60% ammonium perchlorate; and
- (f) about 2% dicyandiamide.

53 (New). An improved reduced energy binder for energetic compositions comprising an amount of cured poly(tetramethylene adipate) polyester polyol polymer having ^{an uncured prepolymer} a molecular weight (M_{W_n}) of at least 6,000 in combination with an amount of one or more energetic plasticizers and wherein the ratio of plasticizer to polymer is less than 1.6:1.

54 (New). A reduced energy binder as in claim 53 wherein the polyester polymer is cured using an amount of a polyisocyanate.

55 (New). A reduced energy binder as in claim 53 further comprising an amount of inert plasticizer.

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56 (New). A reduced energy binder as in claim 55 wherein the inert plasticizer is triacetin.

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57 (New). A reduced energy binder as in claim 53 wherein the one or more energetic plasticizers are selected from the group consisting of nitrate esters of the group consisting of n-butyl-2-nitrotoethyl nitramine; trimethylolethane trinitrate; triethyleneglycol dinitrate; butanetriol trinitrate; nitroglycerin and combinations thereof.

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58 (New). A reduced energy binder as in claim 55 wherein the one or more energetic plasticizers are selected from nitrate esters of the group consisting of n-butyl-2-nitrotoethyl nitramine; trimethylolethane trinitrate; triethyleneglycol dinitrate; butanetriol trinitrate; nitroglycerin and combinations thereof.

59 (New). A reduced energy binder as in claim 57 wherein the plasticizer is selected from the group consisting of nitroglycerin, n-butyl-2-nitrotoethyl nitramine, trimethylolethane trinitrate and combinations thereof.

60 (New). A reduced energy binder as in claim 58 wherein the plasticizer is selected from the group consisting of nitroglycerin, n-butyl-2-nitrotoethyl nitramine, trimethylolethane trinitrate and combinations thereof.

61 (New). A propellant composition as in claim 60 wherein the plasticizer is trimethylolethane trinitrate.

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62 (New). An improved high solids propellant composition comprising by weight:

- C*
- (a) about 11% poly(tetramethylene adipate) MW_n ^{Cured} 6,000 binder polymer;
- (b) about 12% plasticizer selected from the group consisting of nitroglycerin and trimethylolethane trinitrate and combinations thereof;
- (c) about 22% aluminum; and
- (d) about 53% ammonium perchlorate.

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63 (New). An improved high solid propellant composition ³⁷ comprising by weight:

- (a) about 11.3% ^{Cured} poly(tetramethylene adipate) MW_n ^{Cured} 6,200 binder polymer;
- (b) about 12.2% nitroglycerin plasticizer;
- (c) about 22% (30 μ) aluminum; and
- (d) about 53% (200 μ) ammonium perchlorate oxidizer.

64 (New). The propellant composition of claim 62 wherein (d) comprises about 30% ammonium perchlorate and about 22% sodium nitrate.

REMARKS

In accordance with above Preliminary Amendment, the previous pending claims 9-14 and 22-37 (27 claims) have been cancelled and replaced by a new slate of equal number (38-64). The scope of the claims remains essentially unchanged with the new claims being submitted to reorder the numbering and facilitate recognition of the dependency sequence of some claims and also to clarify certain language in the claims. With respect to the independent claims, the present independent claims 38, 43, 51,